

# **Good Fire/Bad Fire**

A **Wood Magic Forest Fair** learning station for 4<sup>th</sup> graders

2023 edition (new science standards highlighted in yellow)

## **Objective**

Students will be able to describe several benefits of prescribed burning and the hazards of not prescribed burning.

## **Overview**

Students will contrast fires that are helpful for humans and nature and those that are harmful. They will then explore the benefits that properly conducted controlled burns provide by examining, comparing and contrasting an unburned area with a prescribed burned area.

## **2021 SC Science Standards**

4-LS1-1. Construct an argument that plants and animals have internal and external structures that function together in a system to support survival, growth, behavior, and reproduction.

4-ESS3-2. Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.

## **Materials List**

*Items for Class:*

- Copy of script
- 30 small fire shirts
- 1 table
- Fire plow

*Items for Speaker A:*

- Wear Nomex fire clothes over WMFF shirt. If you don't have full Nomex, put on a yellow fire shirt
- Pine cone with seeds in it – usually you can find one around the site somewhere
- Good Fire/ Bad Fire posters/flash cards
- Fire triangle diagram
- Matches
- Drip torch. BEFORE SESSION BEGINS, USE DRIP TORCH TO DOUSE GAS ON PINE STRAW PILE. WE TRY TO DO THIS WITHOUT THE STUDENTS WATCHING.
- 1 set of firefighting equipment: fire rake, flapper, Pulaski, drip torch
- Drinking water cooler filled with water (this is for dousing fire at end of day or if someone gets burned)
- White 3-legged fire triangle stool

*Items for Doctor (Speaker B):*

- 1 white lab coat over Wood Magic Forest Fair (WMFF) shirt
- Stethoscope
- 1 clipboard
- 5 Benefit treasure boxes
- 1 prescription pad (small pad of paper to act like you are making a prescription)
- Pens and pencils to put in pocket (for affect)
- Photo of RCW

## **Step-by-Step Procedures**

This is a 25-minute presentation. Practice to make sure you keep on track and within time frames.

**Speaker A: (8 MINUTES)**

**INTRODUCTION:**

**"Hi kids, my name is Mr./Mrs. \_\_\_\_\_. Are you all enjoying your day in the woods? Did you see that movie about Tim? He was quite a STUD, wasn't he?...seriously, what type of resource was Fred?"**

Most will say he was a tree or a board of wood, they may say a recyclable resource.

If they do ask

**"What does that mean?"** They will say you can use it over and over again.

**"That's RECYCLABLE. Aren't trees RENEWABLE resources?"** They will answer yes.

**"So what does renewable mean?"** (Most will say that you can use it again, same answer they gave for recyclable)

**"That means recyclable, what does re-NEW-able mean? If you break the word down it means something is ABLE to RENEW itself. It's able to make new ones. So how does a tree do that?"** They will say that trees can be replanted, or seeded from other trees, to make NEW trees.

**"So a tree drops it's seed out of a pine cone (shake pine cone to show seed falling to the ground) and they fall to the ground and if the ground isn't covered with a bunch of stuff and the seed can make contact with the ground, then it will start growing.** (pause) **That is what we're going to talk about at this station...how to make the ground, or forest floor as we call it, ready for seeds to grow into trees, our renewable resource. We use FIRE to make the forest floor ready for seeds."**

**"First of all, let's talk about other ways fire can be used. What kind of fire is good?"**

(For heating, cooking, seeing, etc. Fire in fireplaces, wood stoves, farmers burning crop stubble, native Americans using fire to run game, cavemen using torches to see at night, campfires for fun or to cook food, etc. Good fire doesn't destroy resources, property and lives)

**"What kind of fires are bad?...why?"**

(Wildfires, house fires, car fires, arson...They destroy resources, property and lives)

**"Let's look at some pictures and tell me whether you think they show bad fire or good fire. You don't have to raise your hand for this part. Shout out 'GOOD' if you think it's good or whisper 'BAD' if you think it's bad fire"**

Hold up cards - go through just one side of each card. Expand on what they see in the pictures. For example;

House on fire- get out of the house and go to neighbors and call 911 (let firefighters put out fire)

Child's sleeve on fire- Stop, Drop and Roll

*The campfire image, unattended, should be second to last. Hold this one up and let the students argue over it.*

*Some will say 'good' some will say 'bad'. Finally talk about why it's bad, it's unattended, the rocks don't hold the fire in if it's windy, etc. Large wildfires have started from unattended campfires.*

*The house in the woods burning should be the LAST picture shown.*

**Speaker A: (INTRODUCTION Continued):**

**" Once when I got home from fighting a wildfire I wasn't feeling too good, so I went to the doctor. She checked my eyes, my ears, my nose and my throat. She made me say 'ah'. Say 'ah' with me. (Have them say "ah" and stick out their tongues, make a face like you are disgusted or "grossed-out". They usually laugh) After checking out all my symptoms, the doctor decided I had Bronchitis. She got out a white pad of paper and wrote something that I could take to the drug store to get some medicine. What is that called that she wrote me? .....(after some effort, someone will say 'prescription' )..... "yes, a prescription."**

**"She PRESCRIBED medicine for me to feel better and make me healthy. "**

**"Believe it or not, foresters do the same thing. We don't prescribe medicine, but we PRESCRIBE FIRE to make the forest safer and healthier."**

**Some of you look a little confused, and I thought that might happen, so I've invited a doctor to come explain this to us. Please join me in welcoming Dr. \_\_\_\_\_** (last name of your teaching partner. Everyone claps as the doctor enters the presentation area).

**SPEAKER B**

**DOCTOR AT FIRST SITE.....UN-BURNED AREA (5 minutes)**

**'Good morning! My name is Dr. \_\_\_\_\_ and I'm what you may call a 'Country Doctor', I take care of the woods and the forests, helping to protect Earth's resources and environments. I'm going to need your help today so I need you to put on that yellow fire shirt you have on your chair. These shirts are made of special material that protects us from fire. "**

Give them a minute to start putting them on. **"Great, let's go look at an un-burned area of the forest"** Start walking to site as they finish putting shirts on. If you wait for them to finish before you start walking, you lose too much time.

**As (Speaker A) \_\_\_\_\_ said the doctor checked her (him) out before making her (his) prescription. What I would like you to do as my fire assistants is to look at this magical forest and describe what you see. Then we can decide whether it is healthy or not. If it is not, we can make a prescription to make it healthier.**

**"First I need a volunteer"** Select someone. Have a tree selected that is big enough around and tall enough for the child to put their ear on the trunk.

**"Step up here and take a listen to this tree. Everyone needs to be quiet.** (wait a second for the student to put the stethoscope to the tree) **OK, what do you hear?"** Hopefully the child will say 'nothing'.

**"Good, because if you heard something, I was going to say YOU need to see a doctor! Why didn't he hear anything? ....That's right, because trees don't talk. So how are we going to tell if a tree is not healthy?"**

**"We need to know what a tree needs to live. So what does a tree need to live?"**

Let there be some raising of hands, suggestions, guesses, etc.

**"Energy from the sun, soil, water, gases such as CO<sub>2</sub> and O<sub>2</sub> from the air and space are what a tree needs. All of these plants out here are competing for these items to be the biggest, strongest and healthiest. It's sort of like if I had a handful of candy for this entire class. That's not enough to go around. So, if I threw them up in the air, (pantomime doing this) you would all scramble for the candy wouldn't you? Well these trees can't move, but they still compete for what they need. Let's see how this forest is doing. "**

Discuss young pine trees under large bushes, undesirable vegetation, fuel load (pine straw, downed trees, leaf litter), underbrush competing vegetation (bushes, and smaller trees) taking nutrients and moisture from desirable species, shading by taller trees, signs of disease or stress in the trees (browning foliage, bug spots, bark flaking off, etc.). Emphasize competition for sunlight, nutrients, space and moisture.

**"So it sounds like we have too much competition in here from other vegetation. How would we remove this undesirable vegetation?"** Many times they will say they will come in and cut down each piece. If they say

that, say something like “Cutting down each piece will take a long time and will be a lot of work. I know I wouldn’t want to walk through all of this and spend days out here. How else could we get rid of some of this vegetation?”

If they don’t say it, say

“How about fire? We could **PRESCRIBE** fire to make this forest healthier. Fire would eliminate the vegetation that we don’t want and leave more **SUN, SOIL, WATER, SPACE** and **AIR** for the trees that are remaining.”

“But before we do this ... we first need to learn about fire, and how we can control fire. Let’s go over to \_\_\_\_\_ (Speaker A) who will tell us more about fire.”

Walk over to Speaker A at burned site

**SPEAKER A - (6 minutes)**

"As forestry professionals, we have to learn about fire, weather, and the environment before we can even light a match. We study fire to make sure we use it correctly and safely.

“There are three ingredients you need to have fire. These three ingredients are called the fire triangle (hold up the poster). Can you read these with me? **Fuel, Heat and Oxygen.**”

“Even though there are only 3 ingredients, we need to know how much of each to apply. Its sort of like baking a cake. Has anyone ever made a cake? Let’s see....it normally takes some flour...so you put in a cup of flour and some eggs....how about a dozen eggs? And some baking soda....maybe an entire box of baking soda?.....No, we wouldn’t put that in like that. Just because we know the ingredients, doesn’t mean we know how to put it all together. What do we need to make it correctly?”

“That’s right....a recipe. The same is true for prescribe fire; we need to understand the amounts of each component of the fire triangle we need to have. Let’s say there is a lot of fuel on the ground. Would that be good? No, the fire might get too hot. Let’s say it is a very windy day to provide our oxygen. Is that good? ...No, it might push the fire beyond where we want it. That is why we study the weather, the fuel moisture, the amount and type of fuel, the topography and many other aspects.”

“This is why **ONLY PROFESSIONALS** use prescribed fire. It’s not something we play with. Fire is a **TOOL**, not a **TOY**. Can you say that with me? ‘Fire is a tool, not a toy’” (have them repeat this with you).

“Now let’s try to make some fire. This is *one time* we don’t want you to go home and show your parents what you learned.”

**What is our fuel?** (they should say the pine straw you have piled up, but they will probably say ‘gas’ or ‘matches’). “**Pine straw.**”

“Where is our oxygen?....That’s right, in the air.”

“**What is our heat source?**” (they often say the sun. You can say this is a heat source but that won’t be strong enough to start the fire. Sometimes they point to the drip torch. You can say that we use that to put fire in the woods but not today.) “**How about a match?**” (hold up the box of matches).

Ask everyone to step back, they will want to crowd around you during this part. Get help from assistants to have them step back. Light the pine straw. Stand up and get the flapper while it burns a little.

**“Now, since this is a MAGICAL forest. We are going to make the fire disappear. On the count of three I want you to say ‘abracadabra’. One...Two...Three ...’abracadabra”** (Gently lower the flap over the fire top avoid scattering embers and wait a few seconds to make sure the fire is out. Lift it up and say...) **“Ta-da! Our magic put this fire out.”** Some of them will say no, it wasn’t magic.

**“What actually put this fire out?”** They will say ‘you suffocated it’.

**“What part of the Fire Triangle was taken away?”** Wait for answers

**“That’s right, the oxygen”**

**“We put a fire line around this area that was burned. (point to the dirt line). What part of the fire triangle was taken away there?.....the Fuel. “**

Go over to the fire stool.

**“It’s sort of like this three-legged stool. If you take away one of the legs, you don’t have a stool. (kick the oxygen leg away). The same is true with fire. Anytime you take away one part of the triangle, you don’t have fire.”**

**“Now let’s listen to the doctor to learn how our prescription of fire for this site made it healthier and safer.”**

#### **SPEAKER B      Benefits of Prescribed Fire    (6 minutes)**

**“Tell me what is different between this site and the unburned site?”** Just take a few responses. (Speaker A can be on this site, holding up things, or pointing out things that the students or the doctor mention).”) )

**“I need 5 volunteers”** They will all raise their hands. Pick quickly. Try to be diverse in selections. **“I need each of you to step in this burned site and find a treasure box. Pick it up, but don’t open it up until I tell you to”.** Each of the 5 students will find one box.

**“Student #1, open your box and read the card inside”** There will be a card that says one of these items below. Talk about this subject as they open them.

##### **1) Healthy Forests**

**“The thick bark of the pine trees protected them from the fire, while the thin-barked small hardwoods couldn’t survive. The prescribed fire got rid of the vegetation that was competing for sun, soil, water, air and space that the desirable species needed. Now the remaining trees and other plants will be healthier.”**

##### **2) Nutrient Recycling.**

**The black on the ground is from the pine straw and logs burning. Does it look like charcoal to you? When the log burns, it releases carbon and other nutrients into the soil, thus making the soil richer and healthier. The tree’s roots can then absorb the nutrients that were locked up in the log before it burned.”**

##### **3) Fresh Food.**

**“If you had a choice between some food that had been sitting out on the counter for a week or fresh food from the refrigerator, which one would you like? Of course, the fresh food.**

**Many animals are the same way. Prescribed fire gets rid of the old, woody vegetation and young vegetation grows back that rabbits and deer love to eat. Wild turkeys and grouse love to eat the insects that live on those grasses. So we have improved the food source, which would help wildlife populations grow.**

##### **4) Habitat**

**“Prescribed fire creates habitat for many animals and plants. Smooth Coneflower and pitcher plant need fire to prepare the forest floor for their survival. Many birds like to have open areas where they can see**

the insects and prey they eat. Prescribed fire makes the forest more open and it allows birds to see and fly farther. It also means that birds can more easily see animals that might eat them, such as snakes.”  
“Who knows what the word endangered means? (this is a 4<sup>th</sup> grade vocabulary word) It means that there aren’t many left. The species is almost extinct. (Show RCW photo) The red-cockaded woodpecker is an endangered bird that needs open forest areas to live, find bugs and not have to worry about other animals preying on them while they are looking for food. So prescribed fire has created very important habitat for animals and plants.”

#### 5) Reduced Chance of Severe Wildfire

**“The amount of litter or pine needles on the ground has been reduced. If there was a wildfire on this site it would be smaller, not as hot or dangerous because much of the “fuel” was eliminated under controlled, safe conditions.”**

#### **CONCLUSION - SPEAKER B**

**"You have all done a great job being fire doctors, analyzing the forest and prescribing fire to make it healthy and safe. Please leave your shirts on the back of your chair for the next class".** If there is still time, field questions or show them the fire equipment.